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IDENTIFIER: US 6240460 B1

TITLE: Method and system for data transmission accordance with the form of the data transmission based on control information exchanged between applications of a data transmitter and a data receiver before data transmission is started

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DATE FILED - AD (1):

19970129

Brief Summary Text - BSTX (121):

A first method is provided for transmitting data between a data transmitter and a data receiver via a data transmission medium including generating characteristic information of data transmission from the data transmitter to the data receiver before execution of the data transmission, storing observed current bandwidth use conditions of the data transmission medium, determining a detailed form of the data transmission based on the observed current bandwidth use conditions and the characteristic information of the data transmission and transmitting the data from the data transmitter in accordance with the detailed form of the data transmission.

Brief Summary Text - BSTX (122):

A second method for controlling a data transmission is provided including determining a detailed form of a data transmission from a data transmitter to a data receiver based on characteristic information of the data transmission and observed current bandwidth use conditions of the data transmission medium before execution of the data transmission, where the characteristic information of the data transmission contains an identifier of the data transmitter and a data amount of the data transmission, and further where the detailed form of the data transmission contains data transmission start time and a transmission bandwidth used, and informing the data transmitter of the detailed form of the data transmission.

Brief Summary Text - BSTX (124):

A method for receiving data in a data transmission system is provided including determining a detailed form of data transmission from a data transmitter to the data receiver based on characteristic information of the data transmission and observed current bandwidth use conditions of the data transmission medium before execution of the data transmissions where

the characteristic information of the data transmission contains an identifier of the data transmitter and a data amount of the data transmission, and further where the detailed form of the data transmission contains data transmission start time and a transmission bandwidth used, and informing the data transmitter of the detailed form of the data transmission.

Brief Summary Text - BSTX (125):

Still another method of transmitting data over a data transmission system is provided including generating characteristic information of data transmission from a data transmitter to a data receiver before execution of the data transmission, where the characteristic information of the data transmission contains an identifier of the data transmitter and a data amount of the data transmission and transmitting the characteristic information of the data transmission. The method further includes receiving at a controller the characteristic information of the data transmission, storing current bandwidth use conditions of the data transmission medium, determining a detailed form of the data transmission based on the current bandwidth use conditions and the characteristic information of the data transmission, where the detailed form of the data transmission contains data transmission start time and a transmission bandwidth used and transmitting information concerning the detailed form of the data transmission. The method still further includes receiving the information at a transmitter concerning the detailed form of the data transmission, transmitting data based on the information concerning the detailed form of the data transmission.

Brief Summary Text - BSTX (126):

Another method of transmitting data over a data transmission system is provided including generating characteristic information at a transmitter of data transmission from the data transmitter to a data receiver before execution of the data transmission, where the characteristic information of the data transmission contains an identifier of the data transmitter and a data amount of the data transmission and transmitting the characteristic information of the data transmission. The method further includes receiving the characteristic information of the data transmission at a controller, storing observed current bandwidth use conditions of the data transmission medium, determining a detailed form of the data transmission based on the observed current bandwidth use conditions and the characteristic information of the data transmission, where the detailed form of the data transmission contains data transmission start time and a transmission bandwidth used, and transmitting information concerning the detailed form of the data transmission. The method still further includes receiving the information concerning the detailed form of the data transmission at the transmitter and transmitting data based on the information concerning the detailed form of the data transmission.

Brief Summary Text - BSTX (127):

A computer program product for controlling a computer system is also provided which includes a storage medium that can be read by input means of the computer system and a

program stored on the storage medium, for causing the computer system to execute data transmission from a data transmitter to a data receiver via a data transmission medium, the program causing the computer system to execute the steps of: (1) determining a detailed form of data transmission from the data transmitter to the data receiver based on characteristic information concerning the data transmission and observed current bandwidth use conditions of the data transmission medium before execution of the data transmission, where the characteristic information of the data transmission contains an identifier of the data transmitter and a data amount of the data transmission, where the detailed form of the data transmission contains data transmission start time and a transmission bandwidth used, and (2) informing the data transmitter of the detailed form of the data transmission.

Brief Summary Text - BSTX (128):

According to a first aspect of the invention, there is provided a data transmission system including a data transmitter, a data receiver, and a data transmission medium for transmitting data from the data transmitter to the data receiver, comprising means for generating characteristic information of data transmission from the data transmitter to the data receiver before execution of the data transmission; means for storing current bandwidth use conditions of the data transmission medium; means for determining a detailed form of the data transmission based on the current bandwidth use conditions and the characteristic information of the data transmission; and means for transmitting the data from the data transmitter in accordance with the detailed form of the data transmission.

Brief Summary Text - BSTX (132):

According to a second aspect of the invention, a data transmission controller in a data transmission system further including a data transmitter, a data receiver, and a data transmission medium for transmitting data from the data transmitter to the data receiver, the data transmission controller comprising means for determining a detailed form of data transmission from the data transmitter to the data receiver based on characteristic information of the data transmission and current bandwidth use conditions of the data transmission medium before execution of the data transmission, wherein the characteristic information of the data transmission contains an identifier of the data transmitter and amount of data of the data transmission and further wherein the detailed form of the data transmission contains data transmission start time and a transmission bandwidth used; and means for informing the data transmitter of the detailed form of the data transmission.

Brief Summary Text - BSTX (136):

In the fifth aspect of the invention, the data transmitter may further comprise means for transmitting information concerning a characteristic change in the data transmission of the data transmitter, and the data receiver may further comprise means for receiving the information concerning characteristic change in the data transmission.

## Brief Summary Text - BSTX (137):

According to a sixth aspect of the invention, there is provided a data transmission system comprising a data transmitter, a data receiver, and a data transmission medium for transmitting data from the data transmitter to the data receiver, wherein the data transmitter comprises means for generating characteristic information of data transmission from the data transmitter to the data receiver before execution of the data transmission; and means for transmitting the characteristic information of the data transmission; the data receiver comprises means for receiving the characteristic information of the data transmission; means for storing current bandwidth use conditions of the data transmission medium; means for determining a detailed form of the data transmission based on the current bandwidth use conditions and the characteristic information of the data transmission; and means for transmitting information concerning the detailed form of the data transmission; and the data transmitter further comprises means for receiving the information concerning the detailed form of the data transmission; and means for causing the data transmitter to transmit data based on the information concerning the detailed form of the data transmission.

## Brief Summary Text - BSTX (138):

According to a seventh aspect of the invention, there is provided a data transmission system comprising a data transmitter, a data receiver, and a data transmission medium for transmitting data from the data transmitter to the data receiver, wherein the data receiver comprises means for receiving characteristic information of data transmission generated by an application of the data transmitter; means for storing current bandwidth use conditions of the data transmission medium; means for determining a detailed form of the data transmission based on the current bandwidth use conditions and the characteristic information of the data transmission; and means for transmitting information concerning the detailed form of the data transmission; and the data transmitter comprises means for receiving the information concerning the detailed form of the data transmission; and means for causing the data transmitter to transmit data based on the information concerning the detailed form of the data transmission.

## Brief Summary Text - BSTX (140):

According to an eighth aspect of the invention, there is provided a data transmission system comprising a data transmitter, a data receiver, a data transmission medium for transmitting data from the data transmitter to the data receiver, and a data transmission controller for controlling transmission of the data, wherein the data receiver comprises means for generating characteristic information of data transmission from the data transmitter to the data receiver before execution of the data transmission; and means for transmitting the characteristic information of the data transmission; the data transmission controller comprises means for receiving the characteristic information of the data transmission; means for storing current bandwidth use conditions of the data transmission medium; means for determining a detailed form of the data transmission based on the current bandwidth use conditions and the

characteristic information of the data transmission; and means for transmitting information concerning the detailed form of the data transmission; and the data transmitter comprises means for receiving the information concerning the detailed form of the data transmission; and means for causing the data transmitter to transmit data based on the information concerning the detailed form of the data transmission.

Brief Summary Text - BSTX (141):

In the eighth aspect of the invention, the data transmitter may further comprise means for transmitting information concerning a characteristic change in the data transmission of the data transmitter, and the data transmission controller may further comprise means for receiving the information concerning the characteristic change in the data transmission.

Brief Summary Text - BSTX (142):

In the eighth aspect of the invention, the data receiver may further comprise means for transmitting information concerning a characteristic change in the data transmission of the data transmitter, and the data transmission controller may further comprise means for receiving the information concerning the characteristic change in the data transmission.

Brief Summary Text - BSTX (143):

According to a ninth aspect of the invention, there is provided a data transmission system comprising a data transmitter, a data receiver, a data transmission medium for transmitting data from the data transmitter to the data receiver, and a data transmission controller for controlling transmission of the data, wherein the data transmitter comprises means for generating characteristic information of data transmission from the data transmitter to the data receiver before execution of the data transmission; and means for transmitting the characteristic information of the data transmission; the data transmission controller comprises means for receiving the characteristic information of the data transmission; means for storing current bandwidth use conditions of the data transmission medium; means for determining a detailed form of the data transmission based on the current bandwidth use conditions and the characteristic information of data transmission; and means for transmitting information concerning the detailed form of the data transmission; and the data transmitter further comprises means for receiving the information concerning the detailed form of the data transmission; and means for causing the data transmitter to transmit data based on the information concerning the detailed form of the data transmission.

Brief Summary Text - BSTX (144):

According to a tenth aspect of the invention, there is provided a data transmission system comprising a data transmitter, a data receiver, a data transmission medium for transmitting data from the data transmitter to the data receiver, and a data transmission controller for

controlling transmission of the data, wherein the data transmission controller comprises means for receiving characteristic information of data transmission generated by an application of the data transmitter; means for storing current bandwidth use conditions of the data transmission medium; means for determining a detailed form of the data transmission based on the current bandwidth use conditions and the characteristic information of the data transmission; and means for transmitting information concerning the detailed form of the data transmission; and the data transmitter comprises means for receiving the information concerning the detailed form of the data transmission; and means for causing the data transmitter to transmit data based on the information concerning the detailed form of the data transmission.

#### Brief Summary Text - BSTX (147):

According to an eleventh aspect of the invention, there is provided a method for transmitting data from a data transmitter to a data receiver via a data transmission medium, comprising the steps of generating characteristic information of data transmission from the data transmitter to the data receiver before execution of the data transmission; storing current bandwidth use conditions of the data transmission medium; determining a detailed form of the data transmission based on the current bandwidth use conditions and the characteristic information of the data transmission; and transmitting data from the data transmitter in accordance with the detailed form of the data transmission.

#### Detailed Description Text - DETX (175):

A data transfer control section 21 determines the point in time at which the data transmission of the contents of data transmission control information will be enabled and the transmission bandwidth that can be used for the data transmission based on the data transmission control information received by the data transmission control information reception section 20 and the bandwidth use conditions of the current data transmission being executed, and uses a data transmission instruction transmission section 22 to return transmission instructions indicating the determination to the associated data transmitter 1. The data transfer control section 21 has a similar configuration to that of the data transfer control section 9 in FIG. 10. However, if the configuration of a use bandwidth change sensing section is FIG. 11(A) or 11(C), the data transmission controller 3 needs to monitor a data flow on the medium.

#### Claims Text - CLTX (3):

generating characteristic information of data transmission from said data transmitter to said data receiver before execution of the data transmission, wherein the characteristic information of the data transmission contains an identifier of said data transmitter and a data amount of the data transmission;

#### Claims Text - CLTX (5):

• determining a detailed form of the data transmission based on the observed current bandwidth use conditions and the characteristic information of the data transmission, wherein the detailed form of the data transmission contains data transmission start time and a transmission bandwidth used; and

Claims Text - CLTX (13):

generating characteristic information of data transmission from said data transmitter to said data receiver before execution of the data transmission, wherein the characteristic information of the data transmission contains an identifier of said data transmitter and a data amount of the data transmission; and

Claims Text - CLTX (18):

determining a detailed form of the data transmission based on the current bandwidth use conditions and the characteristic information of the data transmission, wherein the detailed form of the data transmission contains data transmission start time and a transmission bandwidth used; and

Current US Cross Reference Classification - CCXR (1):

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TITLE: Information transmission apparatus, traffic control apparatus, method of managing bandwidth resources using the same and method of admitting a call, using variable-rate-encoding

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19970930

Abstract Text - ABTX (1):

A notification parameter file, which time-sequentially shows a characteristic of the transmission rate change corresponding to the durable time of a traffic, is notified to a network from a server comprising a storage medium storing data having a traffic characteristic ensured at a transmission starting time. The network adds the characteristic of the transmission rate change designated by the notified parameter to the traffic characteristic already admitted so as to determine whether or not the traffic is admitted. If the traffic can be admitted, the network allocates a transmission bandwidth resource to the sever based on the characteristic of the transmission rate change designated by the notified parameter.

Brief Summary Text - BSTX (2):

The present invention relates to an information transmission apparatus such as a server used in a system for realizing service such as VOD (Video on Demand) in which stored media is reproduced at real time through a network, and a traffic control apparatus, and a method of managing bandwidth resources using the same and a method of admitting a call. Particularly, the present invention relates to an information transmission apparatus in a system in which information is transmitted by use of the storage media storing data, which is VBR (variable bit rate)-encoded, such as a DVD (digital versatile disk), a traffic control apparatus, a method of managing bandwidth resources using the same, and a method of admitting a call.

Brief Summary Text - BSTX (22):

It is an object of the present invention to provide an information transmission apparatus, which can use variable rate storage media such as DVDs as video a sever without being re-encoded, and which can prevent a hard load of the sever side and deterioration of an image quality.

**Brief Summary Text - BSTX (26):**

According to the present invention, there is provided an information transmission apparatus comprising a holding section for holding a time series characteristic of a transmission rate of variable-rate-encoding data every storage medium or every variable-encoding data stored in the storage media; a notifying section for notifying the time series characteristic of the transmission rate, serving as a notification traffic parameter, which corresponds to variable-rate encoding data to be transmitted, to a network for executing a traffic control in accordance with a notification traffic parameter from a call side; and a transmission starting section for starting a transmission upon reception of a notification of connection setting from the network.

**Brief Summary Text - BSTX (27):**

According to the present invention, there is provided a traffic controller comprising a receiving section for receiving a notification traffic parameter from an information transmission apparatus for transmitting variable-rate-encoding data stored in a storage medium; and a section for allocating a transmission bandwidth resource for a variable-rate transmission designated by a time series characteristic to the information transmission apparatus on the basis of the time series characteristic of a transmission rate notified thereby.

**Brief Summary Text - BSTX (28):**

According to the present invention, there is provided a method of managing bandwidth resources wherein a time series characteristic corresponding to a predetermined transmission rate is notified as a traffic parameter from a video server such as a DVD storing VBR-encoded real time data and a bandwidth resource allocation is executed based on the traffic parameter.

**Brief Summary Text - BSTX (29):**

According to the present invention, in an information transmission apparatus such as a server for transmitting variable-rate-encoding data stored in a storage medium to a client through a network where a traffic control is performed in accordance with the notification traffic parameter from a terminal, the information transmission apparatus comprises a holding section for holding a time series characteristic of a transmission rate every storage medium or variable-rate-encoding data stored in the storage medium and a notifying section for notifying the time series characteristic of the transmission rate, which corresponds to variable-rate-encoding data to be transmitted, as the notification traffic parameter.

**Brief Summary Text - BSTX (30):**

In other words, in the information transmission apparatus, by use of the point that the traffic characteristic is ensured in advance in the service for transmitting information from the storage medium such as VOD, the traffic characteristic can be notified as a time series characteristic

even if the traffic characteristic is VBR-encoded. The network side allocates the transmission bandwidth resources having the characteristic corresponding to the characteristic of the time series change of the transmission rate designated by the notified parameter.

#### Brief Summary Text - BSTX (37):

Moreover, according to the present invention, there is provided a method of admitting a call, comprising the steps of notifying a time series characteristic of a predetermined transmission rate from an information transmission apparatus containing a storage medium storing real time data as a traffic parameter; and adding the traffic parameter notified in each exchanger on a path to a traffic characteristic already admitted to determine whether or not the traffic is admitted.

#### Detailed Description Text - DETX (6):

The video server 11 comprises a storage 12, and a network controller 13. The storage 12 includes digital storage medium storing a video source, which is VBR (Variable-Bit-Rate)-encoded by MPEG 2 such as a DVD. The network controller 13 executes an operation control relating to a communication for transmitting the video source read from the storage 12 through a network 14. In the network controller 13, the time sequential characteristic of a predetermined transmission rate is maintained and managed every storage medium or every video source. The time sequential characteristic shows the change characteristic of the transmission rate, which the VBR-encoded video source has, in a time sequential manner.

#### Detailed Description Text - DETX (41):

Thus, according to the above-explained embodiment, in the case of the communication in which the storage medium is used as a source, the feature that the traffic characteristic is determined at the transmission starting time is utilized. The notification parameter file 19, which time-sequentially shows the characteristic of the transmission rate change corresponding to the durable time of the traffic time, is notified to the network 14 from the server 11. The network 14 executes the bandwidth resource allocation based on the characteristic of the transmission rate change designated by the notified parameter. Thereby, the transmission, which is adjusted to the characteristic of the source, and the efficient traffic management, and the running of the network can be executed.

#### Detailed Description Text - DETX (50):

Thus, according to the present invention, the variable bit rate storage medium such as DVD can be used as the video server without performing the re-encoding operation. In this case, in the storage system, the traffic characteristic necessary for a transmission is ensured in advance. Thereby, the traffic management such as traffic characteristic notification, call admission, and decision of path, etc. are carried out. As a result, the transmission, which is

adjusted to the characteristic of the source, and the efficient traffic management, and the running of the network can be executed.

Claims Text - CLTX (2):

holding means for holding a time series characteristic representing a change of a transmission rate corresponding to a continuation time of a traffic every storage medium or every variable-rate-encoded data stored in the storage medium;

Claims Text - CLTX (8):

receiving means for receiving a notification traffic parameter from an information transmission apparatus for transmitting variable-rate-encoded data stored in a storage medium, the notification traffic parameter indicating a time series characteristic representing a change of a transmission rate corresponding to a continuation time of a traffic, wherein said information transmission apparatus is requesting to generate new traffic;

Claims Text - CLTX (12):

4. The traffic controller according to claim 3, further comprising means for adding the time series characteristic of the transmission rate notified by said information transmission apparatus to a traffic characteristic already accepted so as to determine whether or not the traffic from said information transmission apparatus is admitted based on the result of the addition.

Claims Text - CLTX (14):

6. The data transmission apparatus according to claim 1, wherein said storage medium includes a recording medium storing a video source variable-rate-encoded by MPEG2.

Claims Text - CLTX (15):

7. The data transmission apparatus according to claim 1, wherein said notifying means prepares a transmission schedule of a variable rate for realizing a variable-rate characteristic of said storage medium as faithful as possible in a form of a file containing a time series of the transmission rate change, and said notifying means manages the file as a time series characteristic of a predetermined transmission rate.

Claims Text - CLTX (17):

notifying a traffic parameter from an information transmission apparatus containing a storage medium storing real time data, the traffic parameter indicating a time series characteristic representing a change of a transmission rate corresponding to a continuation time of a traffic;

and

Claims Text - CLTX (21):

notifying a traffic parameter from an information transmission apparatus containing a storage medium storing real time data, the traffic parameter indicating a time series characteristic representing a change of a transmission rate corresponding to a continuation time of a traffic; and

Claims Text - CLTX (28):

a holding section which holds a time series characteristic representing a change of a transmission rate corresponding to a continuation time of a traffic every storage medium or every variable-rate-encoded data stored in the storage medium;

Claims Text - CLTX (34):

16. The data transmission apparatus according to claim 13, wherein said storage medium includes a recording medium storing a video source variable-rate-encoded by MPEG2.

Claims Text - CLTX (35):

17. The data transmission apparatus according to claim 13, wherein said notifying section prepares a transmission schedule of a variable rate for realizing a variable-rate characteristic of said storage medium as faithful as possible in a form of a file containing a time series of the transmission rate change, and said notifying section manages the file as a time series characteristic of a predetermined transmission rate.

Claims Text - CLTX (37):

a receiver section which receives a notification traffic parameter from an information transmission apparatus for transmitting variable-rate-encoded data stored in a storage medium, the notification traffic parameter indicating a time series characteristic representing a change of a transmission rate corresponding to a continuation time of a traffic, wherein said information transmission apparatus is requesting to generate a new traffic;

Claims Text - CLTX (41):

19. The traffic controller according to claim 18, further comprising an admission determining section which adds the the series characteristic of the transmission rate notified by said information transmission apparatus to a traffic characteristic already accepted and determines whether or not the traffic from said information transmission apparatus is admitted based on the result of the addition.

Claims Text - CLTX (45):

holding means for holding a time series characteristic of a transmission rate of variable-rate-encoding data every storage medium or every variable-encoding data stored in the storage medium;

Claims Text - CLTX (46):

notifying means for once notifying a network of the time series characteristic, serving as a notification traffic parameter, which corresponds to variable-rate-encoding data to be transmitted, for executing a traffic control in accordance with a notification traffic parameter from a calling side;

Claims Text - CLTX (50):

24. The data transmission apparatus according to claim 22, wherein said storage medium includes a recording medium storing a video source variable-rate-encoded by MPEG2.

Claims Text - CLTX (51):

25. The data transmission apparatus according to claim 22, wherein said notifying means prepares a transmission schedule of a variable rate for realizing a variable-rate characteristic of said storage medium as faithful as possible in a form of a file containing a time series of the transmission rate change, and said notifying means manages the file as a time series characteristic of a predetermined transmission rate.

Claims Text - CLTX (53):

receiving means for receiving a notification traffic parameter from an information transmission apparatus for transmitting variable-rate-encoding data stored in a storage medium, wherein said information transmission apparatus is requesting to generate new traffic;

Claims Text - CLTX (58):

notifying a time series characteristic of a predetermined transmission rate from an information transmission apparatus containing a storage medium storing real time data as a traffic parameter when a call is requested by said information transmission apparatus; and

Claims Text - CLTX (61):

notifying a time series characteristic of a predetermined transmission rate from an information transmission apparatus containing a storage medium storing real time data as a traffic parameter when a call is requested by said information transmission apparatus; and

## Claims Text - CLTX (64):

a holding section which holds a time series characteristic of a transmission rate of variable-rate-encoding data every storage medium or every variable-encoding data stored in the storage medium;

## Claims Text - CLTX (65):

a notifying section which once notifies a network of the time series characteristic of the transmission rate, serving as a notification traffic parameter, which corresponds to variable-rate-encoding data to be transmitted, for executing a traffic control in accordance with a notification traffic parameter from a calling side;

## Claims Text - CLTX (70):

a receiver section which receives a notification traffic parameter from an information transmission apparatus for transmitting variable-rate-encoding data stored in a storage medium wherein said information transmission apparatus is requesting to generate a new traffic;

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## Current US Cross Reference Classification - CCXR (3):

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## Current US Cross Reference Classification - CCXR (4):

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